

BANKHEAD RESERVOIR MANAGEMENT REPORT 2005

Prepared by

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Introduction

Bankhead Reservoir was previously sampled in 2000, 1996, 1995, and 1988 (Moss et al 2000). A detailed description of the physical characteristics of the reservoir can be found in the 1988 Management Report (Moss and McHugh 1988). Sampling in 2005 indicated that the population structure for black bass was less dynamic and catch rates were generally below those reported in previous samples, particularly for largemouth bass. The crappie population exhibited satisfactory structure, high catch rates, poor to variable recruitment, and rapid growth.

Methods

Bankhead Reservoir was sampled in 2004-05 according to the guidelines of the Alabama Reservoir Management Manual. Bass tournament information was collected through the Bass Angling Information Team (BAIT).

Results and Discussion

Largemouth Bass

The electrofishing catch per hour (CPH) of largemouth bass (N=132) in 2005 was 75.7, a catch rate well below the lake average of 100.1 fish/hr (Table 2). Although the largemouth bass population continues to exhibit satisfactory size and age structure, recent collections have shown a slight downward trend. RSD values for stock, quality and preferred size fish were 65, 22, and 14 percent, respectively. Quality and preferred size fish had values that were below statewide means, while stock size fish were above the statewide mean and exceeded the 75th percentile of RSD values for largemouth bass (Figure 4).

Relative condition (Wr) of largemouth bass (87-90) approximated statewide means but values for quality and preferred size fish were slightly below the reported average. Eight age classes of largemouth bass were represented in the 2005 collection; however, the sample was dominated by one and two year old fish (Figure 2).

Bankhead Lake was not ranked among 20 Alabama reservoirs reporting five or more tournaments in the 2004 BAIT report. Only two tournament reports were received by the Division of Wildlife and Freshwater Fisheries and these provided only limited information concerning bass tournament activity. However, these reports indicated that

a total of 71 anglers caught 230 bass weighing 320 pounds having an average weight of 1.39 pounds and a success rate of 94%. The number of bass caught per angler day was 3.89, while the pounds per angler day were reported to be 5.40.

Spotted Bass

In 2005, spotted bass (N=115) were captured at a rate of 22.4 fish/hr. The CPH was above the lake average (20.5 fish/hr) and slightly higher than samples collected in 2000 and 1996 (Table 3). Electrofishing catch rates in 2005 exceeded the lake average for all RSD size categories with the exception of preferred size fish, which fell slightly below the mean value of 2.1 fish/hr. Bankhead spotted bass catch rates for substock, stock and preferred size fish were near the lower 25th percentile of CPH values for spotted bass, statewide. RSD values for spotted bass were 34, 47, 10 and 10 percent for RSD-S, RSD-Q, RSD-P and RSD-M categories, respectively. The values for stock and preferred size fish were below statewide means while quality and memorable sized fish were above RSD values for spotted bass, statewide (Figure 7). Relative weights (Wr) of spotted bass (85-100) in 2005 were similar to lake averages, but below mean values for each RSD category.

Ten year classes of spotted bass were represented in the 2005 Bankhead sample; however, one, two and three-year old spotted bass dominated the collection (Figure 5).

Bluegill

One hundred and nine bluegill were captured during the 2005 Bankhead sample ranging from 40-170 mm in total length (Figure 11). The size structure of the bluegill population was very similar to previous collections in 2000 and 1996. Bluegill sunfish that measured 90-100 mm TL were abundant in the sample.

White Crappie

One hundred and sixty six white crappie were collected from trap nets during November 2004 with only 29 net-nights of effort. Catch rates of white crappie during fall 2004 significantly exceeded the lake record and were considerable higher than catch rates recorded from previous samples.

The 2003 year-class of crappie was exceptionally large, composing over 75% of the collection (Figure 8). This large year class will likely impact the crappie population

in Bankhead Reservoir for the next several years, but over time, fewer individuals of the 2003 year-class will be available for anglers to harvest and they will perceive a decline in the quality of the crappie fishery. The combined white crappie collection included ten age classes (ages 0+ to 9+). RSD values for Bankhead white crappie in 2004 were 8%, 52%, 25% and 15% for stock, quality, preferred and memorable size fish, respectively (Table 4). The RSD value for stock size fish was well below the statewide average and considerably below the 25th percentile of RSD-S values, statewide (Figure 10). Catch rates for substock and stock size fish were low, near the 25 percentile of CPE values for crappie statewide (Figure 9) indicating poor recruitment. Relative weight values (74-96) were near the lake averages and similar to previous collections.

Aquatic Plants

Bankhead Reservoir has experienced an expanding aquatic plant problem that was first noted in the 2000 report. Presently, water hyacinth and water primrose are established in most shallow water habitats of the lake, but the hyacinth explosion noted in 2000 has not been as severe following treatment efforts by the Army Corps of Engineers. Personnel from the Alabama Wildlife and Freshwater Fisheries Division continue to conduct surveys of the aquatic plant community in this reservoir.

Summary

Overall, the black bass fishery at Bankhead Reservoir continues to be satisfactory but downward trends were noted in electrofishing catch rates. Structural indices for smaller spotted bass were below statewide averages indicating that recruitment is limited. The crappie population is composed of one relatively strong year class that dominates and is supporting the fishery. White crappie suffer from high annual mortality and poor to variable recruitment issues. However, crappie populations exhibited unusually high catch rates and rapid growth in Bankhead Reservoir during 2004.

Recommendations

- 1) Resample Bankhead Lake in FY 2007-08.
- 2) Encourage an aggressive aquatic plant management program by the Army Corps of Engineers directed at preventing the spread of water hyacinths and primrose.
- 3) Encourage more local bass clubs to participate in the BAIT Program.

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TABLE 1. MORPHOMETRIC , PHYSICAL AND CHEMICAL
CHARACTERISTICS AT BANKHEAD RESERVOIR .

Surface area	9,245 acres
Drainage area	3,969 sq. mi.
Full pool elevation	257 feet-msl
Mean annual fluxuation	2 feet
Shoreline distance	400 miles
Shoreline development index	29.8 (Welch 1952)
Mean depth	32 feet
Maximum depth	74 feet
Outlet depth	70 feet
Thermocline depth	30 feet
S tratification index	$7.7 \text{ (cfs*365)/dsf}$
Total dissolved solids	122 mg/l
Morphoedaphic index	$3.8 \text{ TDS/mean depth(ft)}$ (Ryder 1965)
Growing season	232 frost free days (Jenkins 1967)
Reservoir age	90 years

TABLE 2. RELATIVE STOCK DENSITY (RSD), CATCH PER HOUR (CPH), AND RELATIVE WEIGHT (Wr) OF LARGEMOUTH BASS DURING SPRING ELECTROFISHING SURVEYS AT BANKHEAD RESERVOIR.

YEAR	NO. OF SAMPLES	TOTAL EFFORT	SUBSTOCK			RSD-S				RSD-O				RSD-P				RSD-M				TOTAL	
			NO.	CPE	SSR	NO.	CPE	PCT.	Wr	NO.	CPE	PCT.	Wr	NO.	CPE	PCT.	Wr	NO.	CPE	PCT.	Wr	NO.	CPE
1995	3	1.34	20	14.9	17	44	32.7	37	88	43	32.0	36	87	30	22.3	25	90	3	2.2	3	105	140	104.2
1996	3	1.37	32	23.3	22	63	45.9	43	88	46	33.5	32	90	34	24.8	23	93	3	2.2	2	79	178	129.7
2000	4	1.81	14	8.0	9	82	47.0	55	89	48	27.5	32	91	18	10.3	12	93	2	1.1	1	86	164	90.8
2005	4	1.74	30	17.2	29	66	37.8	65	88	22	12.6	22	87	14	8.0	14	90					132	75.7
LAKE AVERAGE				15.9	19		40.9	50	88		26.4	30	89		16.4	19	92		1.9	2	90		100.1

TABLE 3. RELATIVE STOCK DENSITY (RSD), CATCH PER HOUR (CPH), AND RELATIVE WEIGHT (Wr) OF SPOTTED BASS DURING SPRING ELECTROFISHING SURVEYS AT BANKHEAD RESERVOIR.

YEAR	NO. OF SAMPLES	TOTAL EFFORT	SUBSTOCK			RSD-S				RSD-Q				RSD-P				RSD-M+T				TOTAL	
			NO.	CPE	SSR	NO.	CPE	PCT.	Wr	NO.	CPE	PCT.	Wr	NO.	CPE	PCT.	Wr	NO.	CPE	PCT.	Wr	NO.	CPE
1995	10	5.10	24	4.7	26	35	6.9	38	92	43	8.4	47	93	9	1.8	10	100	5	1.0	5	103	116	22.7
1996	10	5.03	14	2.8	15	25	5.0	27	95	53	10.5	57	95	13	2.6	14	94	2	0.4	2	99	107	21.3
2000	10	5.08	5	1.0	7	21	4.1	28	94	39	7.6	52	95	11	2.1	15	99	4	0.8	5	115	80	15.8
2005	10	5.14	12	2.3	12	35	6.8	34	85	48	9.3	47	90	10	1.9	10	96	10	1.9	10	100	115	22.4
LAKE AVERAGE				2.7	15		5.7	32	92		9.0	51	93		2.1	12	97		1.0	6	104		20.5

TABLE 4. RELATIVE STOCK DENSITY (RSD), CATCH PER EFFORT (CPE), AND RELATIVE WEIGHT (Wr) OF WHITE CRAPPIE DURING FALL TRAP NET SURVEYS AT BANKHEAD RESERVOIR.

YEAR	NO. OF SAMPLES	TOTAL EFFORT	SUBSTOCK			RSD-S				RSD-O				RSD-P				RSD-M				TOTAL	
			NO.	CPE	SSR	NO.	CPE	PCT.	Wr	NO.	CPE	PCT.	Wr	NO.	CPE	PCT.	Wr	NO.	CPE	PCT.	Wr	NO.	CPE
1995	40	40.00	13	0.3	11	6	0.2	5	89	31	0.8	27	89	50	1.3	43	96	28	0.7	24	95	128	3.2
1996	40	40.00	50	1.3	91	3	0.1	5	70	29	0.7	53	87	16	0.4	29	94	7	0.2	13	90	105	2.6
1999	45	45.00	23	0.8	28	17	0.6	21	67	29	1.0	35	73	25	0.9	30	83	11	0.4	13	85	105	2.3
2004	29	29.00	16	0.6	11	12	0.4	8	74	78	2.7	52	86	38	1.3	25	92	22	0.8	15	96	166	5.7
LAKE AVERAGE				0.7	35		0.3	10	75		1.3	42	84		1.0	32	91		0.5	16	92		3.5

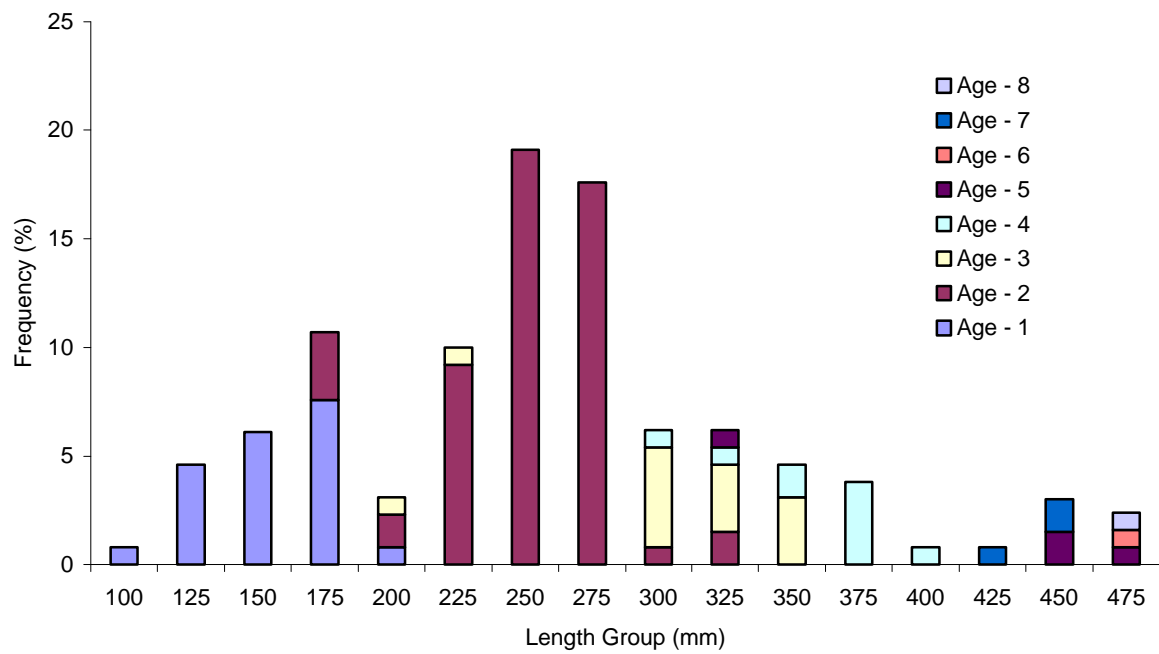


Figure 2. Length at age frequency of largemouth bass (N=132) at Bankhead Reservoir, April 2005.

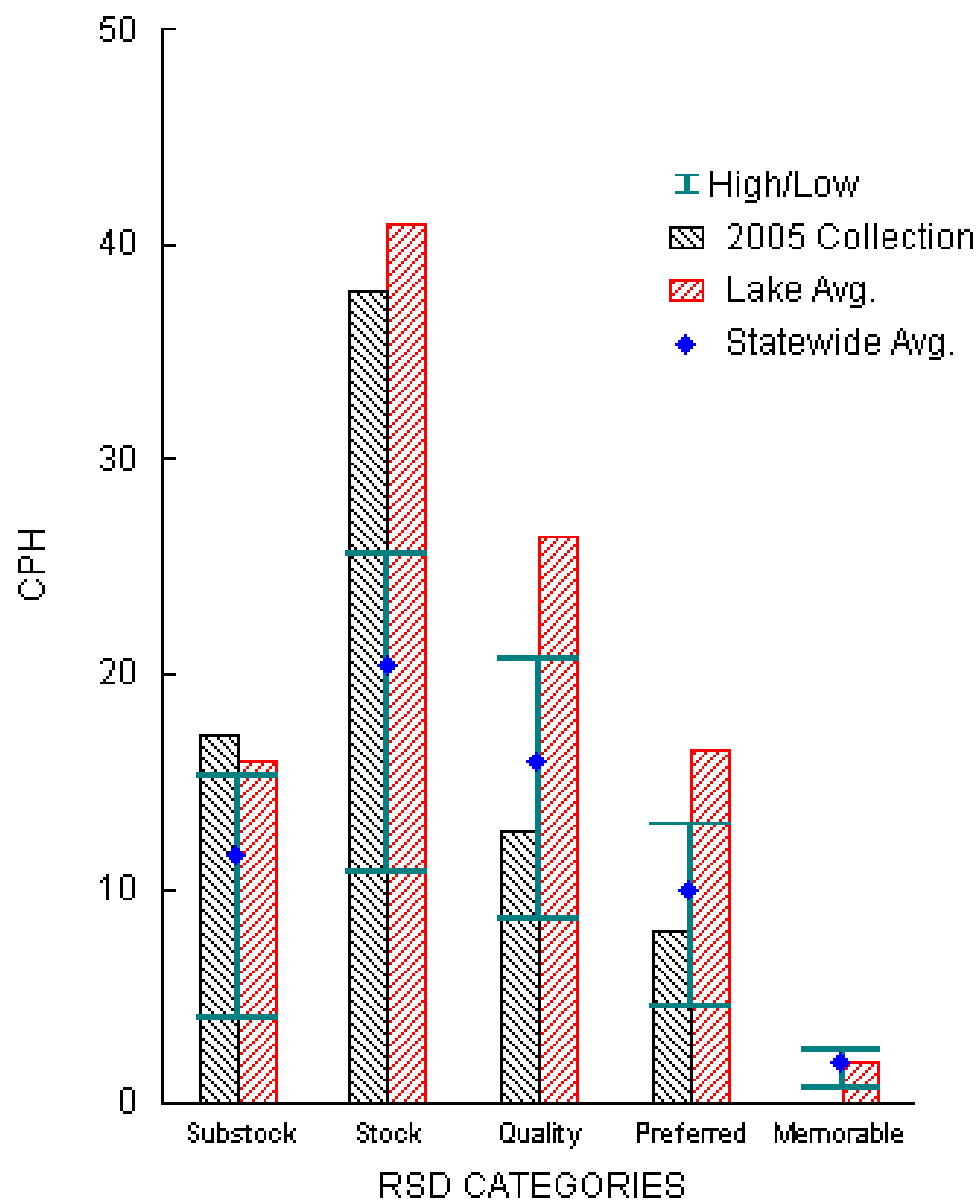


Figure 3. The catch per hour (CPH) of largemouth bass in Bankhead Reservoir, spring 2005, the lake average, and the statewide average. The I-beam denotes the 25th and 75th percentiles of CPH values for largemouth bass, statewide.

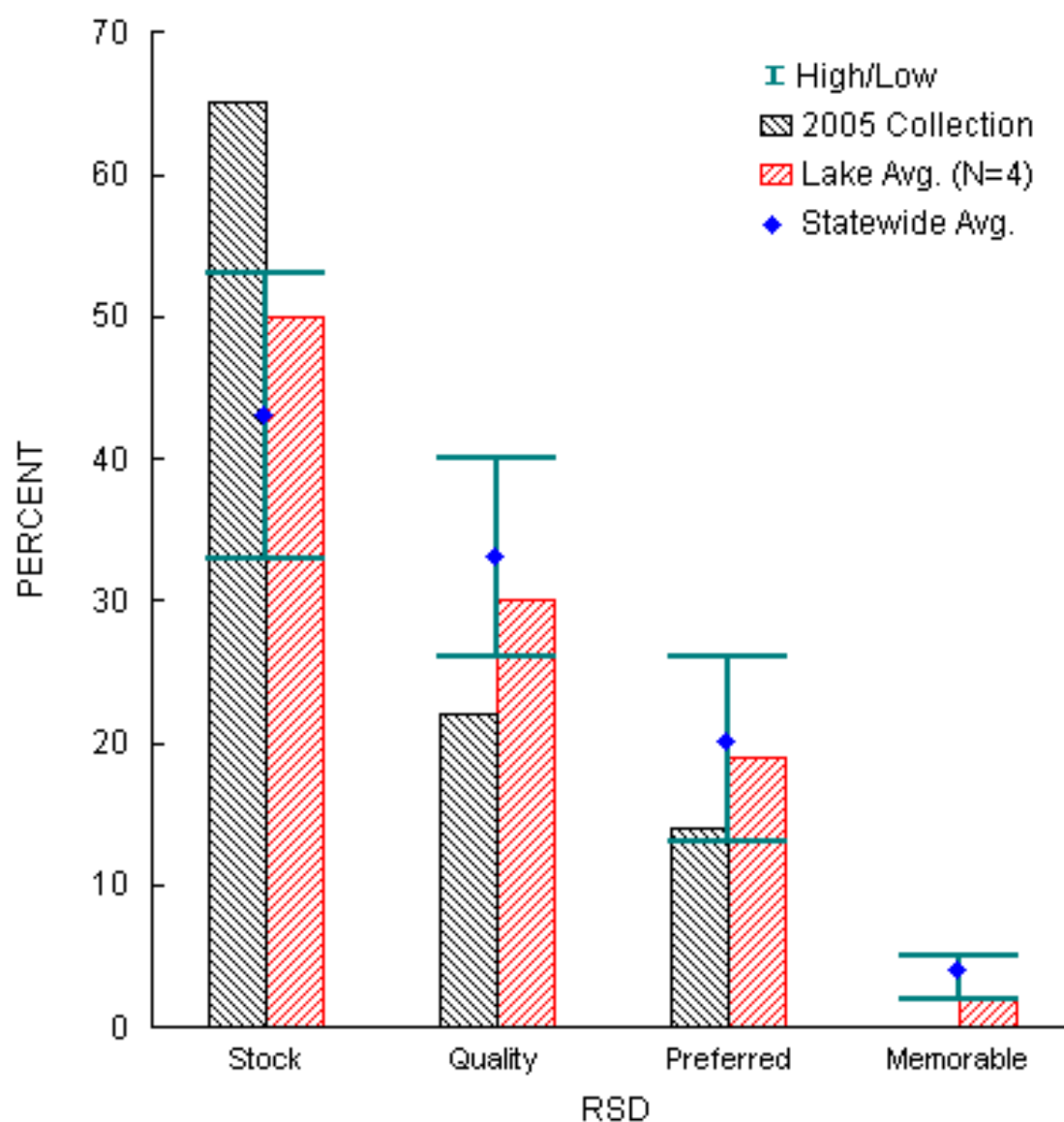


Figure 4. The relative stock density (RSD) of largemouth bass in Bankhead Reservoir, spring 2005, the lake average, and the statewide average. The I-beam denotes the 25th and 75th percentiles of RSD values for largemouth bass, statewide.

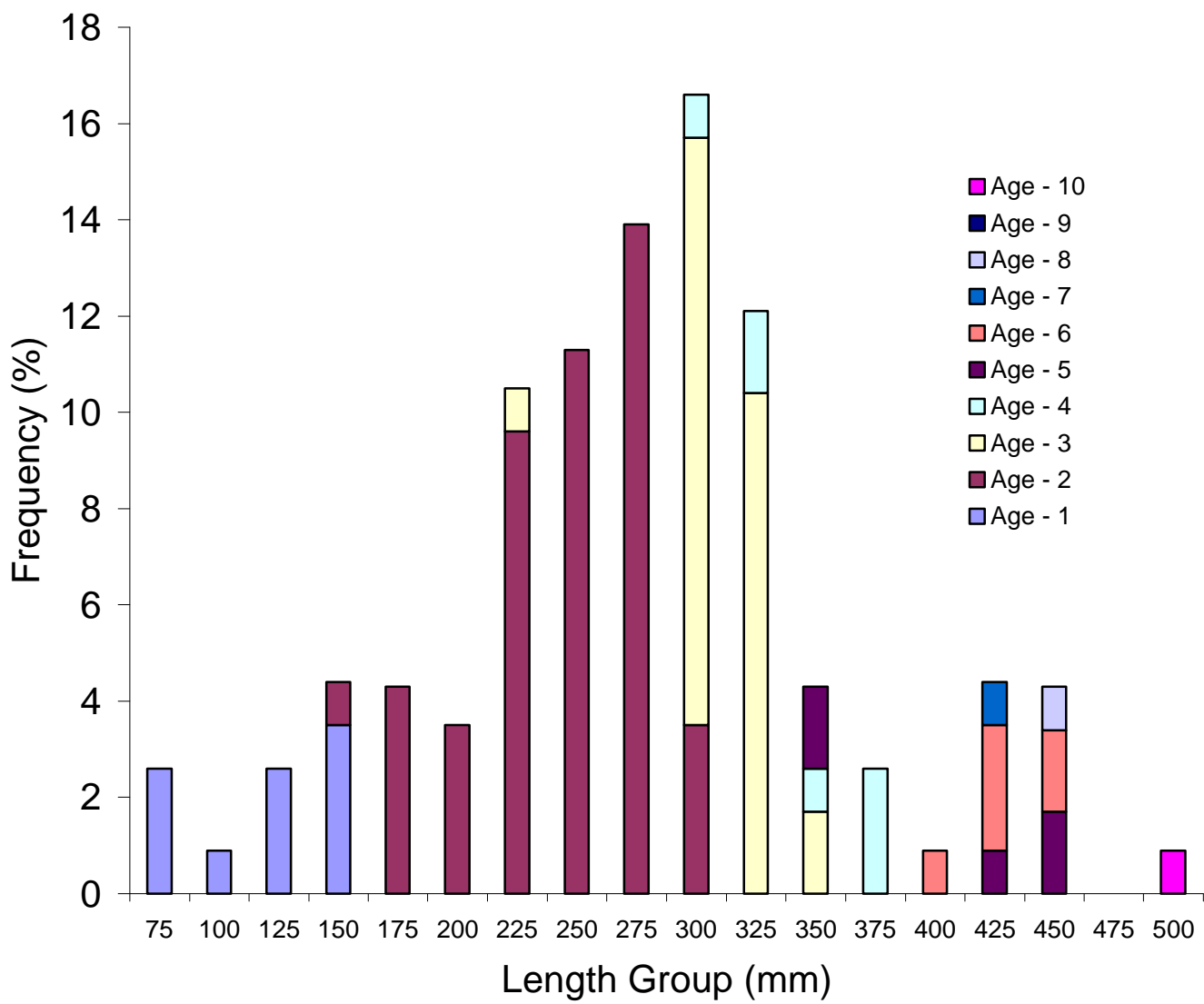


Figure 5. Length at age frequency of spotted bass (N=115) at Bankhead Reservoir, April 2005.

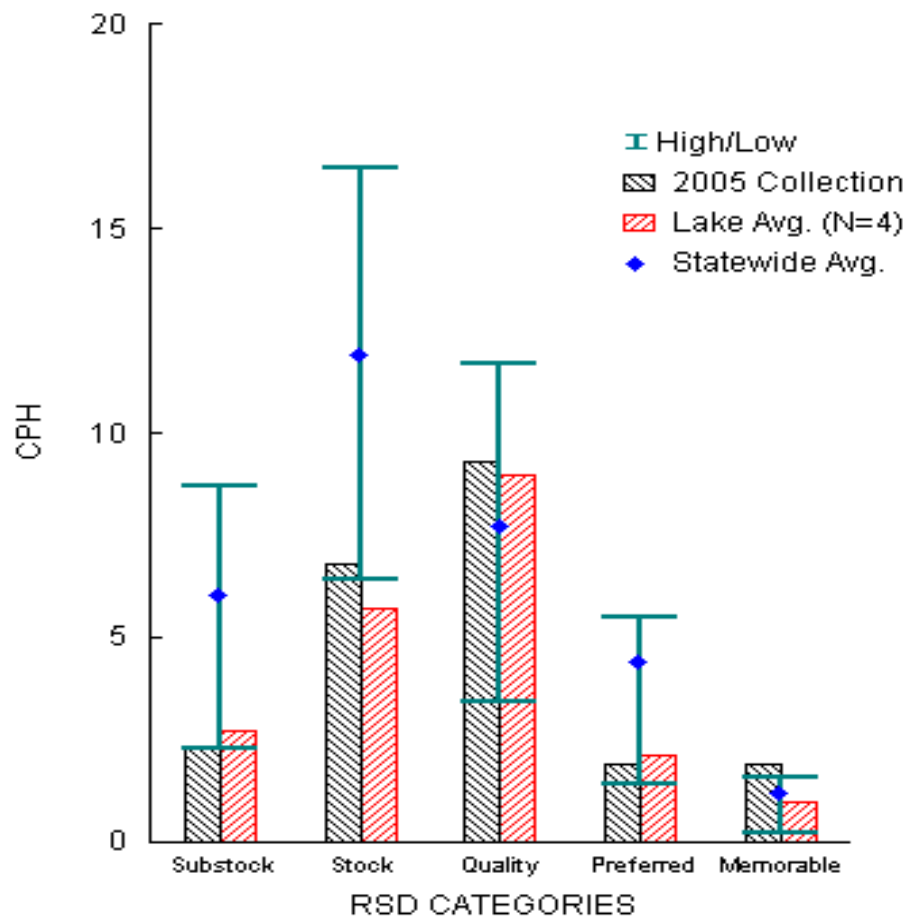


Figure 6. The catch per hour (CPH) of spotted bass in Bankhead Reservoir, spring 2005, the lake average, and the statewide average. The I-beam denotes the 25th and 75th percentiles of CPH values for spotted bass, statewide.

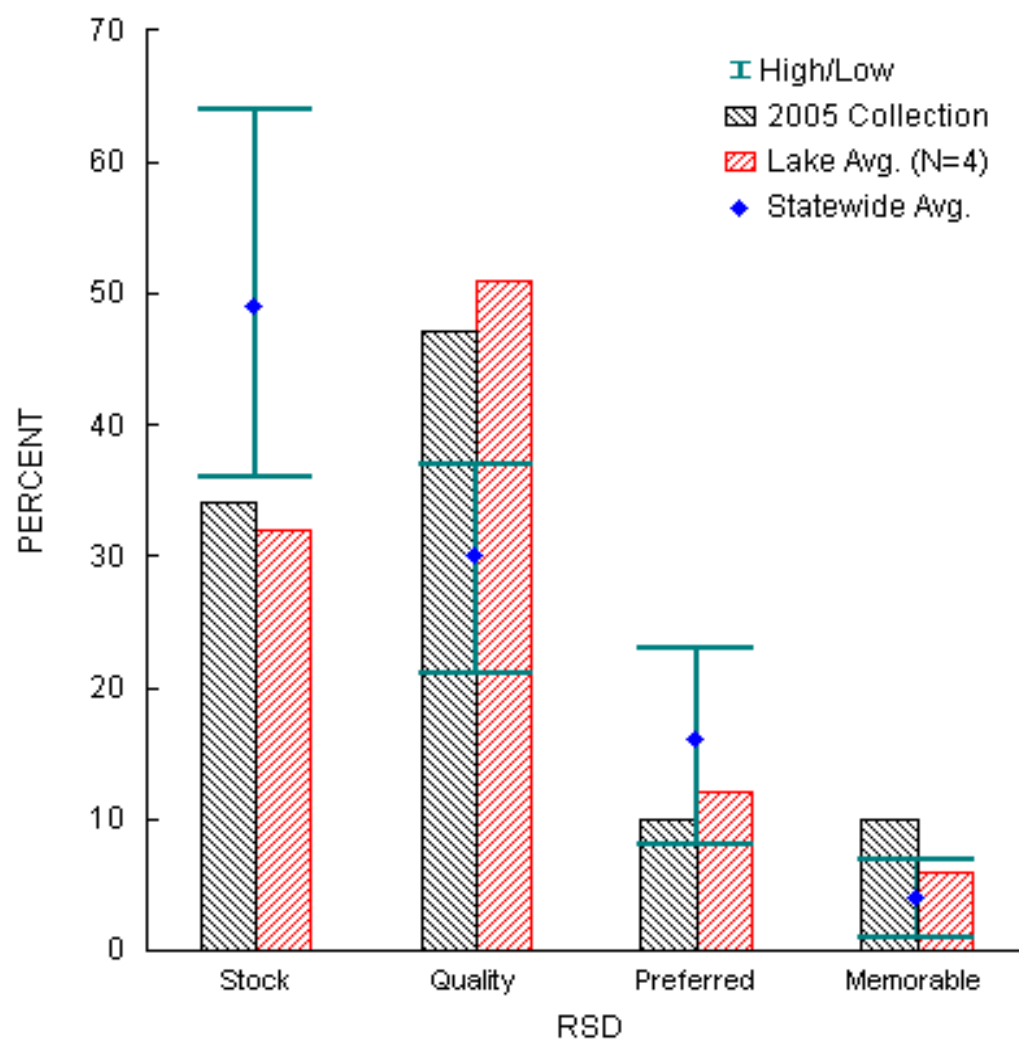


Figure 7. The relative stock density (RSD) of spotted bass in Bankhead Reservoir, spring 2005, the lake average, and the statewide average. The I-beam denotes the 25th and 75th percentiles of RSD values for spotted bass, statewide.

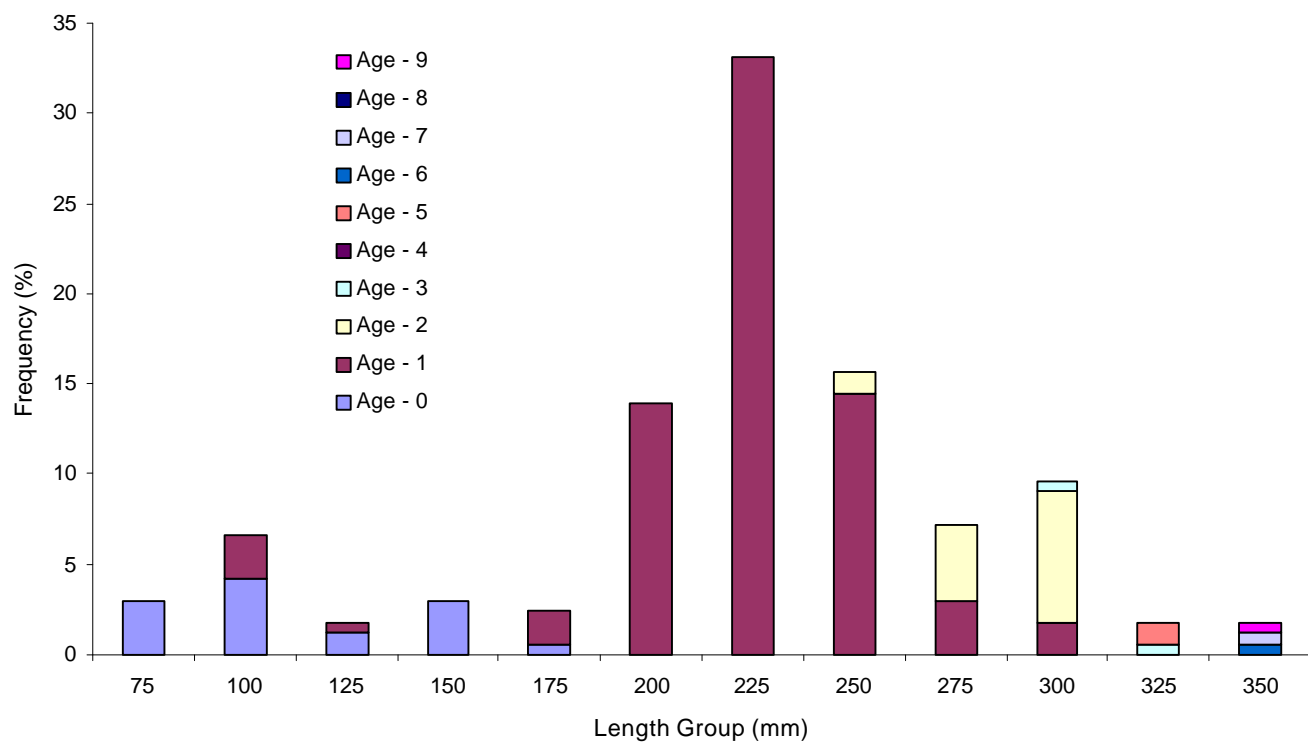


Figure 8. Length at age frequency of white crappie (N=166) at Bankhead Reservoir, November 2004.

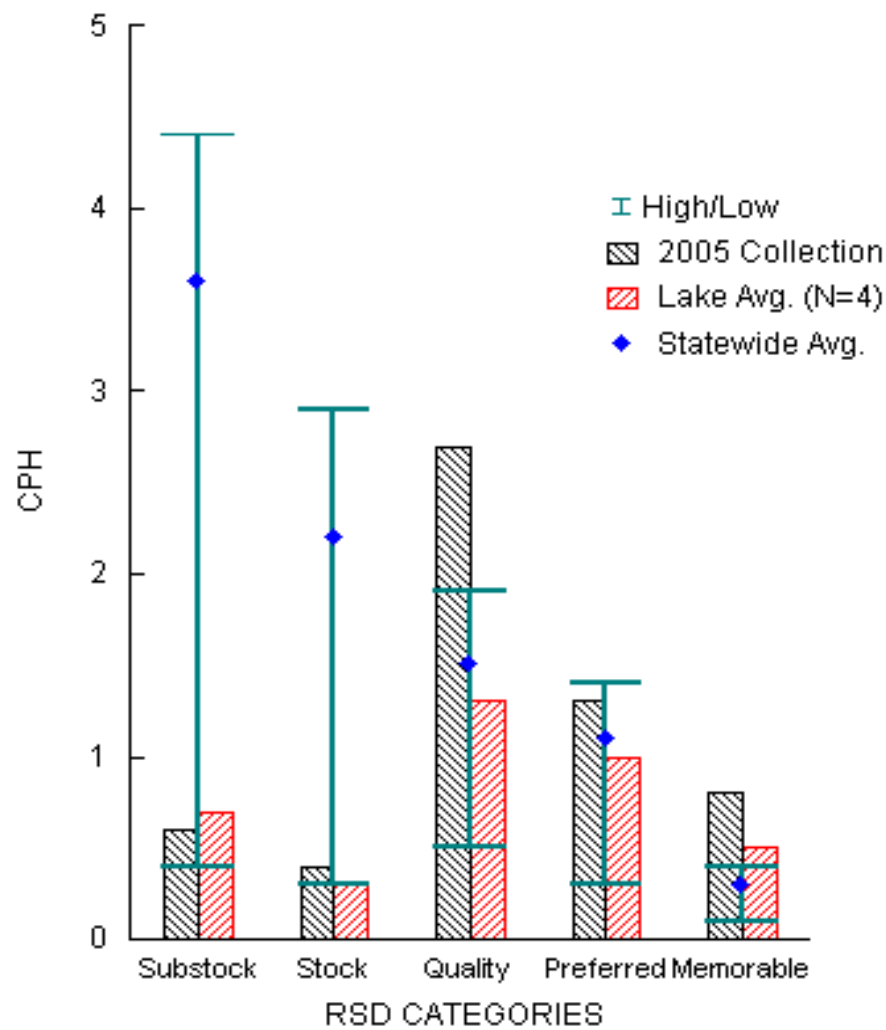


Figure 9. The catch per effort (CPE) of white crappie in Bankhead Reservoir, fall 2004, the lake average, and the statewide average. The I-beam denotes the 25th and 75th percentiles of CPE values for crappies, statewide.

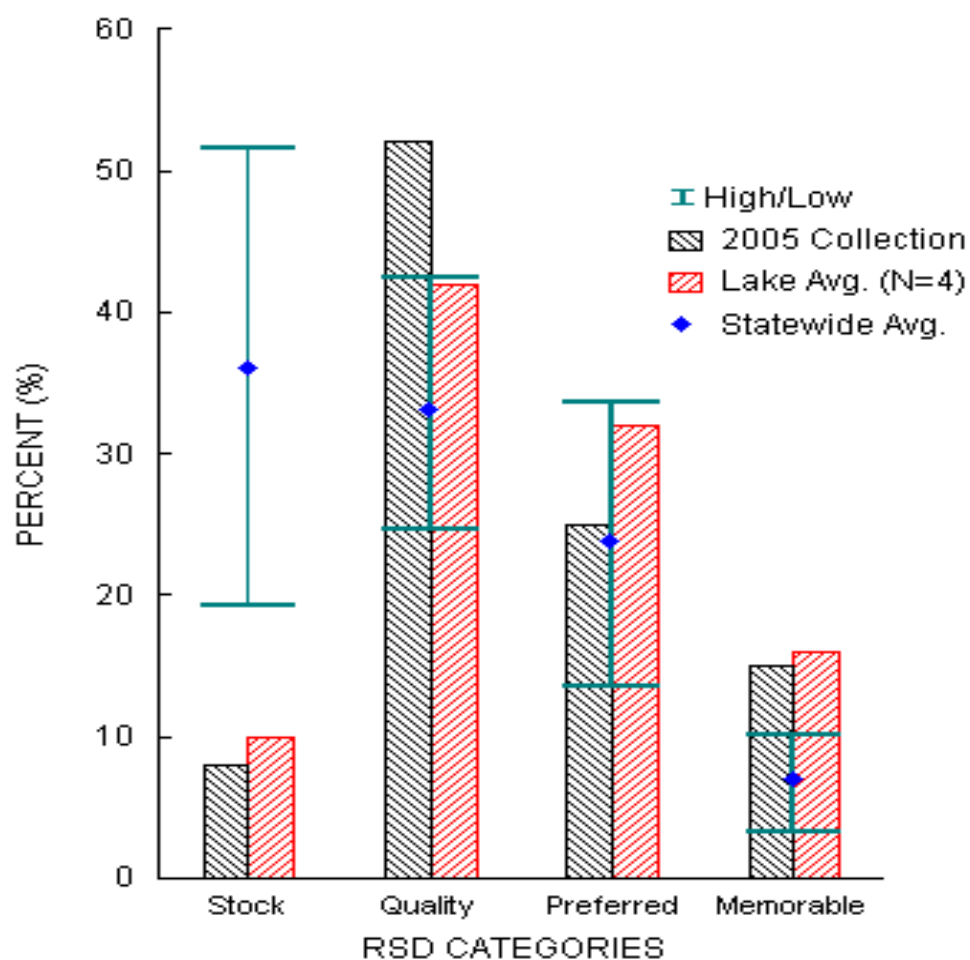


Figure 10. The relative stock density (RSD) of white crappie in Bankhead Reservoir, fall 2004, the lake average, and the statewide average. The I-beam denotes the 25th and 75th percentiles of RSD values for crappies, statewide.

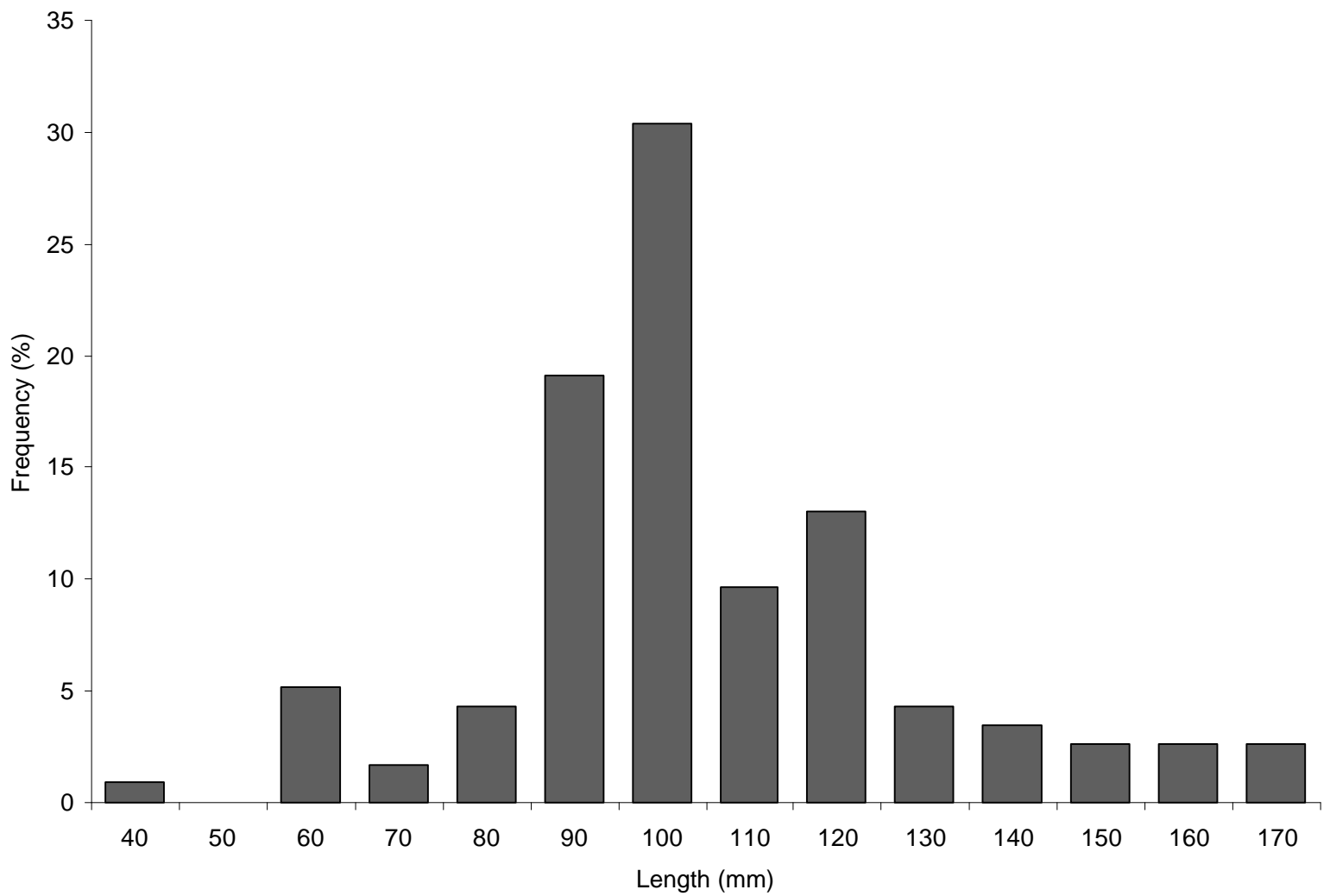


Figure 11. Length frequency of bluegill sunfish (N=109) at Bankhead Reservoir, April 2005.